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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/668,914	09/23/2003	Nishant Sinha	2269-5859US (02-0390.00/U)	2525
24247	7590	12/15/2005	EXAMINER	
TRASK BRITT P.O. BOX 2550 SALT LAKE CITY, UT 84110			LINDSAY JR, WALTER LEE	
			ART UNIT	PAPER NUMBER
			2812	

DATE MAILED: 12/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/668,914

Applicant(s)

SINHA, NISHANT

Examiner

Walter L. Lindsay, Jr.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25-32 and 64-66 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 25-32 and 64-66 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 9/28/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

This Office Action is in response to an Election filed on 9/28/2005.

Currently, claims 25-32 and 64-66 are pending.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 25-32 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The addition of "an aperture that communicates with the first surface and extends partially through the substrate" is not supported by the specification.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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2. Claims 25-29, 31 and 32 are rejected under 35 U.S.C. 102(e) as being anticipated by Halahan et al. (U.S. Patent No. 6,498,381, filed 2/22/2001).

Halahan shows the structure as claimed in Figs. 1-5 and in the corresponding text as: a substrate (110) having a first surface and an opposing, second surface and including an aperture that communicates with the first surface and extends partially through the surface (col. 2, line 65-col. 3, line 8); at least one via (130) extending into the first surface of the substrate and terminating short of the opposing, second surface (col. 3, lines 9-28); and including a seed layer at least partially over a surface of the aperture, an annular conductive layer (320) contacting the seed layer (310) and a filler material circumscribed by contacting the annular conductive layer (340) (col. 3, lines 36-51) (claim 25). Halahan teaches that the annular conductive layer comprises a metal formed on the seed layer (310)(the metal layer is formed on top of the seed layer(col. 3, lines 36-44) (claim 26). Halahan teaches that the filler material is selected from the group consisting of spin-on-glass, polysilicon, solder paste and solder alloy (silicon dioxide or like materials)(col. 4, lines 41-55) (claim 27). Halahan teaches that the filler material is either a conductive or a nonconductive filler material (col. 3, lines 45-51) (claim 28). Halahan teaches that the seed layer is selected from the group consisting of titanium nitride, titanium, tantalum nitride, copper, silicon nitride, and polysilicon (col. 4, lines 41-55) (claim 29). Halahan teaches that an insulative layer (310) is located between the annular conductive layer and the substrate (col. 3, lines 39-44) (claim 31). Halahan teaches that a barrier layer (120) is formed on the first surface (col. 2, line 65-col. 3, line 8) (claim 32).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Halahan et al. (U.S. Patent No. 6,498,381, filed 2/22/2001) in view of Bhatt et al (U.S. Patent No. 6,418,616, filed 2/28/2001).

Halahan shows the structure substantially as claimed and as described in the preceding paragraph.

Halahan lacks anticipation only in not explicitly teaching that: 1) the metal layer is selected from the group of metals consisting of metals consisting of nickel, cobalt, copper, silver, titanium, iridium, gold, tungsten, tantalum, molybdenum, platinum, palladium, nickel-phosphorus, palladium-phosphorus, cobalt-phosphorous, a Co-W-P alloy, alloys of the foregoing metals and mixtures of any of the foregoing (claim 30).

Bhatt show a process of filling a through hole and filling it. In Fig. 1 substrate (10) undergoes plating initiation via deposition of a seed layer (col. 4, lines 17-41). In Fig. 2 a layer of electrically conductive metal (14) preferably copper is deposited on the surfaces in the through hole (col. 4, lines 17-41). This process aids in overcome the problem overetching of metals during subtractive etch method of circuitization.

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the structure of Halahan by choosing a metal from the group consisting of nickel, cobalt, copper, silver, titanium, iridium, gold, tungsten, tantalum, molybdenum, platinum, palladium, nickel-phosphorus, palladium-phosphorus, cobalt-phosphorous, a Co-W-P alloy, alloys of the foregoing metals and mixtures of any of the foregoing, as taught by Bhatt, with the motivation that Bhatt teaches a process that aids in overcome the problem overetching of metals during subtractive etch method of circuitization.

6. Claims 64-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Halahan et al. (U.S. Patent No. 6,498,381, filed 2/22/2001) in view of Farnworth et al (U.S. Patent No. 6,620,731, filed 1/4/2002).

Halahan shows the structure substantially as claimed and as described in the preceding paragraph.

Additionally, Halahan teaches: 1) a substrate having a first surface and an opposing, second surface (col. 2, line 65-col. 3, line 8); and at least one via extending into the first surface of the substrate and terminating short of the opposing, second surface (col. 3, lines 9-28) (claim 64); 2) an insulative layer located between the

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conductive filler material and the substrate (col. 3, lines 40-51)(claim 65); and 3) a barrier layer on the first surface, col. 2, line 65-col. 3, line 8) (claim 66).

Halahan lacks anticipation only in not explicitly teaching that: 1) including solder that extends from the first surface (claim 64).

Farnworth shows a method for forming semiconductor components and interconnects with contacts on opposing sides. Farnworth shows a via (30) being formed in substrate (10) (col. 6, lines 39-46). Via (30) is then coated with an insulating layer 32. A solder metal is then screen printed in the vias (30) and drawn into the via(30) with capillary action (col. 6 lines 47-61). This process is employed to provide improved electronic assemblies and test systems in order to improve electrical communication (col. 12, lines 6-11).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the structure of Halahan, by filling the via with a solder alloy that extends from the first surface, as taught by Farnworth, with the motivation that Farnworth teaches a process for improving electronic assemblies and test systems in order to improve electrical communication.

Response to Arguments

7. Applicant's arguments filed 9/28/2005 have been fully considered but they are not persuasive. The examiner views Halahan as anticipating the structure of as described in claim 25. Layer (310) was considered the seed layer since a seed layer that facilitates growth as layer (310) displays.

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8. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). Halahan provides a via as does Farnworth, Farnworth also disclose the use of solder being drawn into a via, structure, both teachings would be accessible to one of ordinary skill in the art at the time the invention was made.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter L. Lindsay, Jr. whose telephone number is (571) 272-1674. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael S. Lebentritt can be reached on (571) 272-1873. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Walter L. Lindsay, Jr.
Examiner
Art Unit 2812

WLL

December 10, 2005